## Description

### JMG P-channel Advanced Mode Power MOSFET

**Features**

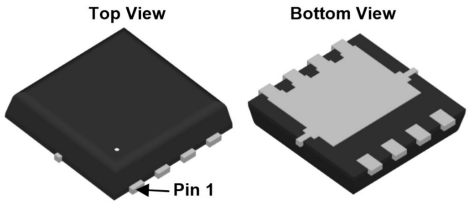
- -100V, -25A
  $R_{DS(ON)}$< 46mΩ @ $V_{GS}$ = -10V
  $R_{DS(ON)}$< 53mΩ @ $V_{GS}$ = -4.5V
- Advanced Split Gate Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

**Application**

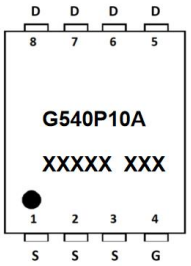
- Load Switch
- PWM Application
- Power management

*100% UIS TESTED!*
*100% ΔVds TESTED!*

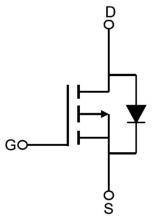
RoHS




PDFN5x6-8L




Marking and pin Assignment




Schematic Diagram

## Package Marking and Ordering Information

| Device Marking | Device | OUTLINE | Device Package | Reel Size | Reel (PCS) | Per Carton (PCS) |
|---|---|---|---|---|---|---|
| G540P10A | JMGG540P10A | TAPING | PDFN5x6-8L | 13inch | 5000 | 25000 |

## Absolute Maximum Ratings ($T_C$=25℃ unless otherwise specified)

| Symbol | Parameter | | Max. | Units |
|---|---|---|---|---|
| $V_{DSS}$ | Drain-Source Voltage | | -100 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±20 | V |
| $I_D$ | Continuous Drain Current | $T_C$ = 25℃ | -25 | A |
| | | $T_C$ = 100℃ | -16 | A |
| $I_{DM}$ | Pulsed Drain Current note1 | | -100 | A |
| $E_{AS}$ | Single Pulsed Avalanche Energy note2 | | 121 | mJ |
| $P_D$ | Power Dissipation | $T_C$ = 25℃ | 84 | W |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | | 1.48 | ℃/W |
| $T_J$, $T_{STG}$ | Operating and Storage Temperature Range | | -55 to +150 | ℃ |

## Electrical Characteristics ($T_J$=25℃ unless otherwise specified)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| **Off Characteristic** | | | | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=-250μA | -100 | - | - | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-100V, $V_{GS}$=0V, | - | - | -1.0 | μA |
| $I_{GSS}$ | Gate to Body Leakage Current | $V_{DS}$=0V, $V_{GS}$= ±20V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=-250μA | -1.0 | - | -2.5 | V |
| $R_{DS(on)}$ | Static Drain-Source on-Resistance note3 | $V_{GS}$=-10V, $I_D$=-20A | - | 37 | 46 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-10A | - | 41 | 53 | |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$=-50V, $V_{GS}$=0V, f=1.0MHz | - | 1704 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 197 | - | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 44 | - | pF |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-50V, $I_D$=-5A, $V_{GS}$=-10V | - | 34 | - | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 4 | - | nC |
| $Q_{gd}$ | Gate-Drain(“Miller”) Charge | | - | 9 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-on Delay Time | $V_{DD}$=-50V, $I_D$=-5A, $R_G$=6.2Ω, $V_{GS}$=-10V | - | 9 | - | ns |
| $t_r$ | Turn-on Rise Time | | - | 19 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 115 | - | ns |
| $t_f$ | Turn-off Fall Time | | - | 170 | - | ns |
| **Drain-Source Diode Characteristics and Maximum Ratings** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | -25 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | -100 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$=0V, $I_S$=-25A | - | - | -1.2 | V |
| $t_{rr}$ | Body Diode Reverse Recovery Time | $T_J$=25℃, $I_F$=-5A,dI/dt=100A/μs | - | 54 | - | ns |
| $Q_{rr}$ | Body Diode Reverse Recovery Charge | | - | 78 | - | nC |

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: $T_J$=25℃, $V_{DD}$=-50V, $V_{GS}$=-10V, $R_G$=25Ω, L=0.5mH, $I_{AS}$=-22A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

## Typical Performance Characteristics

**Figure1:** Output Characteristics

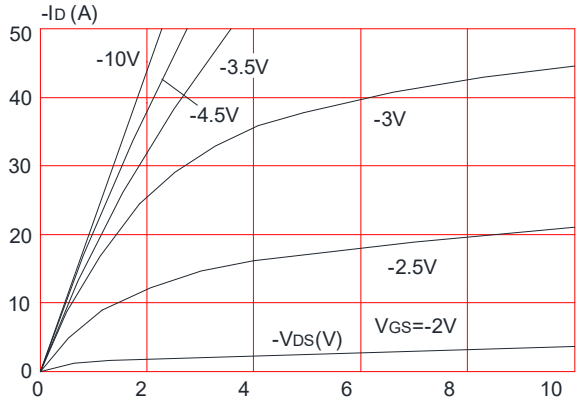



**Figure 2:** Typical Transfer Characteristics

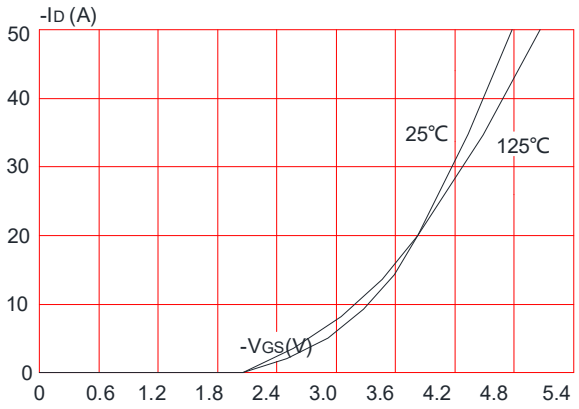



**Figure 3:** On-resistance vs. Drain Current

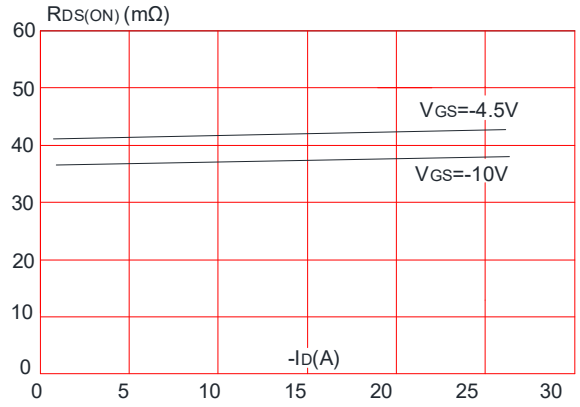



**Figure 4**: Body Diode Characteristics

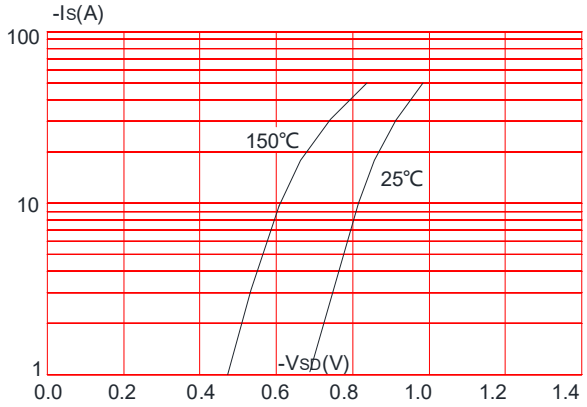



**Figure 5:** Gate Charge Characteristics

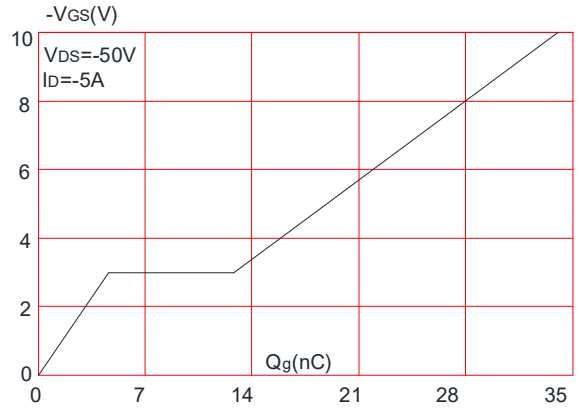



**Figure 6:** Capacitance Characteristics

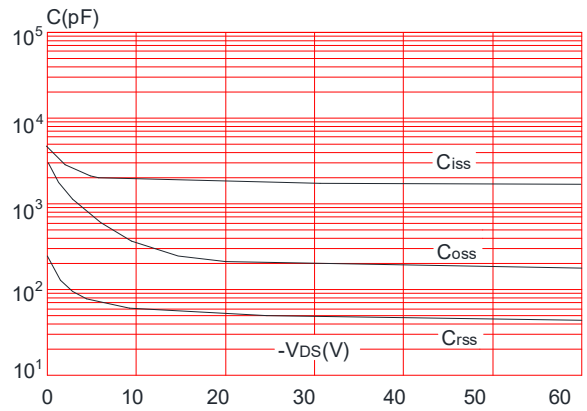


**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

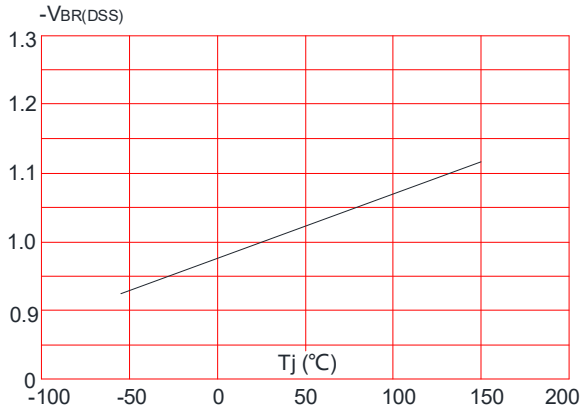



**Figure 8:** Normalized on Resistance vs. Junction Temperature

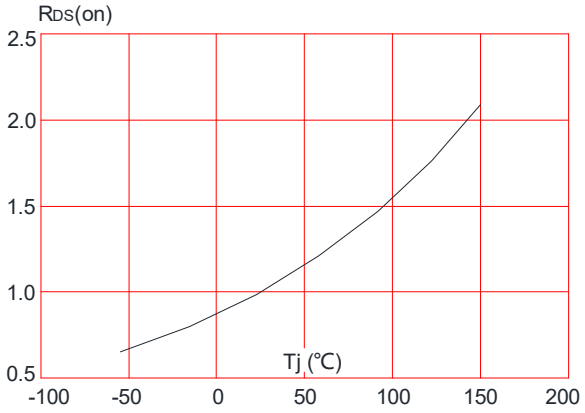



**Figure 9:** Maximum Safe Operating Area

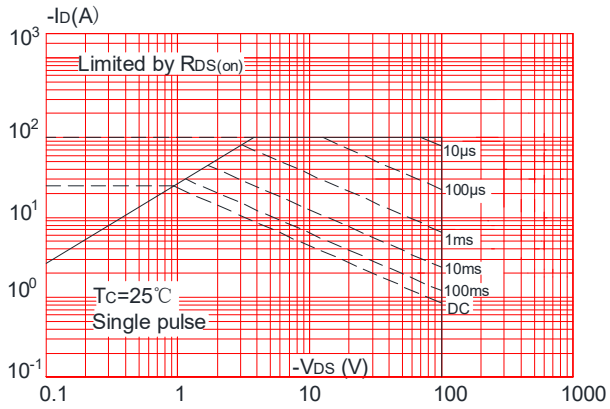



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

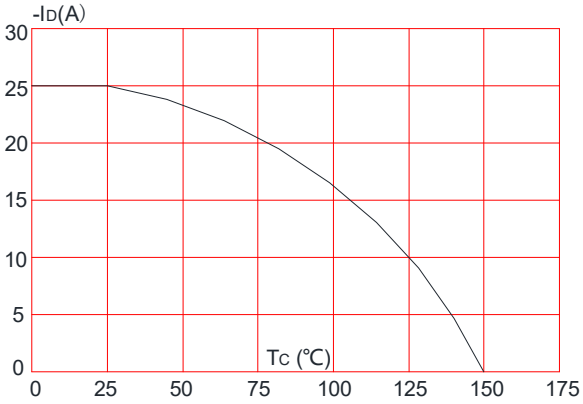
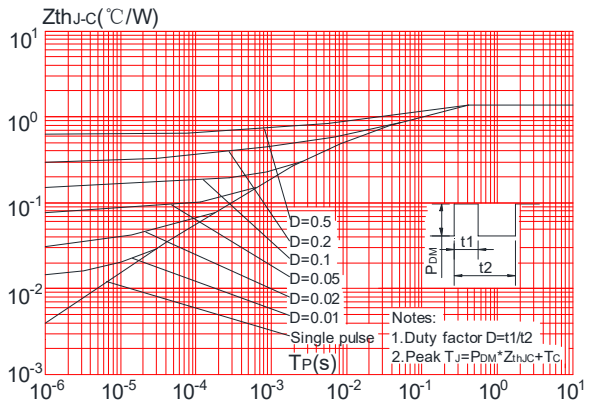



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



## Test Circuit

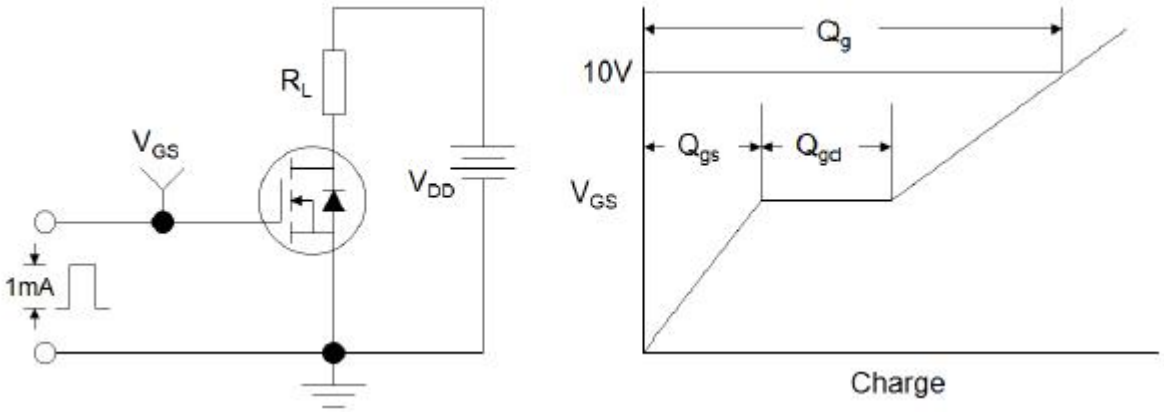



**Figure1:Gate Charge Test Circuit & Waveform**

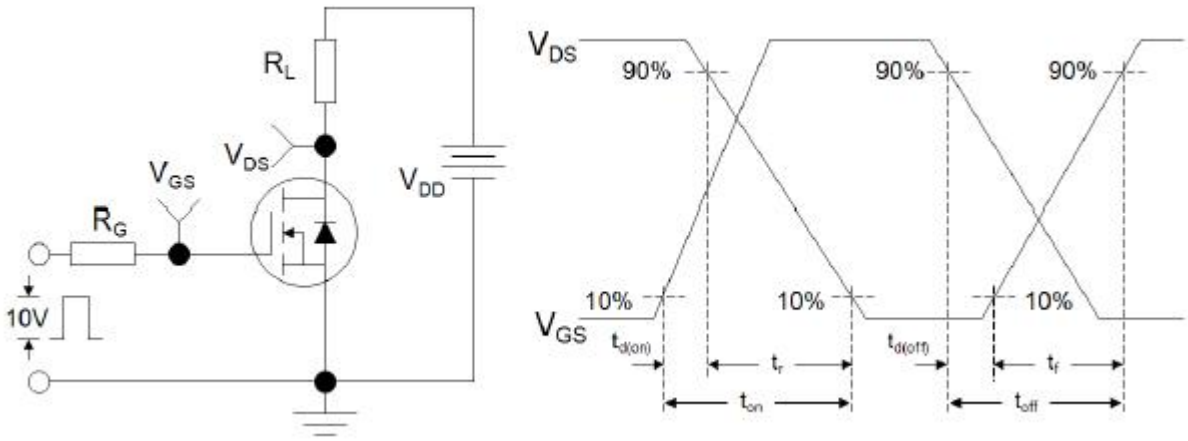



**Figure 2: Resistive Switching Test Circuit & Waveforms**

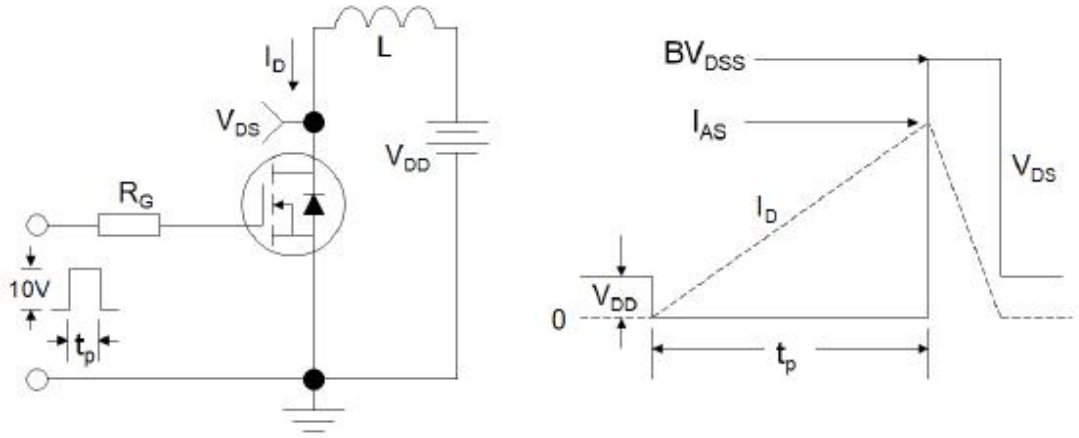
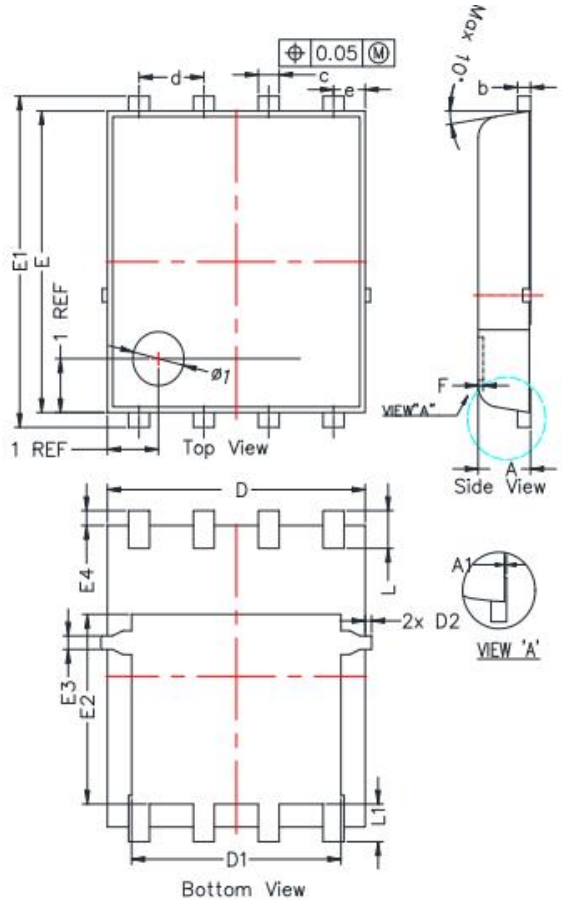



**Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms**

## Package Mechanical Data-PDFN5x6-8L




| SYMBOLS | DIMENSION IN MM | | | DIMENSION IN INCHES | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| * A | 0.900 | 1.000 | 1.100 | 0.035 | 0.039 | 0.043 |
| A1 | 0.000 | --- | 0.050 | 0.000 | ---- | 0.002 |
| b | 0.246 | 0.254 | 0.312 | 0.010 | 0.010 | 0.012 |
| * c | 0.310 | 0.410 | 0.510 | 0.012 | 0.016 | 0.020 |
| d | | 1.27 BSC | | | 0.050 BSC | |
| * D | 4.950 | 5.050 | 5.150 | 0.195 | 0.199 | 0.203 |
| D1 | 4.000 | 4.100 | 4.200 | 0.157 | 0.161 | 0.165 |
| * D2 | --- | --- | 0.125 | --- | --- | 0.005 |
| e | | 0.62 BSC | | | 0.024 BSC | |
| * E | 5.500 | 5.600 | 5.700 | 0.217 | 0.220 | 0.224 |
| * E1 | 6.050 | 6.150 | 6.250 | 0.238 | 0.242 | 0.246 |
| E2 | 3.425 | 3.525 | 3.625 | 0.135 | 0.139 | 0.143 |
| E3 | 0.150 | 0.250 | 0.350 | 0.006 | 0.010 | 0.014 |
| * E4 | 0.175 | 0.275 | 0.375 | 0.007 | 0.011 | 0.015 |
| F | - | - | 0.100 | - | - | 0.004 |
| * L | 0.500 | 0.600 | 0.700 | 0.02 | 0.02 | 0.03 |
| L1 | 0.600 | 0.700 | 0.800 | 0.02 | 0.03 | 0.03 |